IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA

CHARLESTON DIVISION

OHIO VALLEY ENVIRONMENTAL COALITION, INC., WEST VIRGINIA HIGHLANDS CONSERVANCY, INC., and SIERRA CLUB,

Plaintiffs,

v. CIVIL ACTION NO. 2:13-5006

FOLA COAL COMPANY, LLC,

Defendant.

ORDER SPECIFYING RELIEF

In its Memorandum Opinion and Order of October 14, 2015 (ECF No. 167), the Court found that injunctive relief to correct Defendant's violation was appropriate, but declined to order a specific remedy, and indicated that it would consider appointing a Special Master. The parties responded with no objection to the appointment of James Kyles, but sought clarification of his role. ECF No. 174. The Court conferred with the parties, and has further considered the matter. Pursuant to Rule 53(a)(1)(C), the Court has contemporaneously appointed James H. Kyles as a Special Master of Engineering to perform the duties described herein. This appointment is proper because the injunctive relief includes complex analysis and implementation of environmental engineering plans and monitoring to correct Defendant's violations.

The Court also now further addresses specific injunctive relief to remedy Defendant's violations. The Court **DIRECTS** Defendant to implement such measures as are necessary to reduce the level of conductivity in Stillhouse Branch to 300 microsiemens per centimeter (300 µS/cm) or less or to achieve passing WVSCI scores in Stillhouse Branch. To this end, the Special

Master will require Defendant to submit for his review and approval a specific plan and schedule to complete Alternatives 1 or 2, or similar approach, from Mr. Meek's report. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 2, at 9–14, ECF No. 147. The Special Master is authorized to determine what sampling and other data, plan details and modeling, and other information must be supplied by Defendant to consider its plan. To approve Defendant's plan, the Special Master must determine, consistent with customary engineering principles and practices, that the plan is reasonably likely to reduce conductivity in Stillhouse Branch below Outlet 29 to a level at or below 300 µS/cm, while simultaneously not negatively impacting Twentymile Creek or any other receiving water body. The Court explains its decision below.

I. Background on Streams

Stillhouse Branch is a tributary of Twentymile Creek, which is a tributary of the Gauley River. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 2, at 2, ECF No. 147. It consists of "approximately 600 feet of channel and two 50 foot culverts[1] that extend from . . . . outlet 029 to the confluence with Twentymile Creek." *Id.* Stillhouse Branch has an estimated average flow rate of 805 gallons per minute. *Id.* at 4. The mouth of Stillhouse Branch enters Twentymile approximately 14 miles upstream from Twentymile's confluence with the Gauley River. *Id.* Twentymile Creek is in "the northwestern portion of the Gauley River watershed and drains approximately 86.6 square miles (55,454 acres)." ECF No. 171, Pls' Ex. 45. "The dominant land use in the watershed is forest, which covers 73.6% of the watershed. Other significant land use types include mining (23.6%), and urban/residential (1.7%)." *Id.* Overall, there are 22

[1] A culvert is "a drain or pipe that allows water to flow under a road or railroad." Merriam-Webster, (2015), http://www.merriam-webster.com/dictionary/culvert.

impaired streams in the watershed, including Twentymile Creek. *Id.*

Specifically with regards to the impaired nature of Twentymile Creek and Stillhouse Branch, Dr. Baker indicated in his expert rebuttal report that in 1977 a water quality sample taken in Stillhouse Branch prior to proposed mining activity in the larger Twentymile Creek watershed recorded three conductivity readings below 50 µS/cm. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 5, at 2, ECF No. 147. Since the completion of the Fola mine in 2003, conductivity in the watershed has consistently exceeded 3000 µS/cm (tenfold greater than the EPA benchmark). *Id.*

II. Parties' Submissions

Plaintiffs urged the Court to order Defendant to install a reverse osmosis treatment system. Presented through the testimony of Dr. Drew McAvoy, Plaintiffs' environmental engineer expert, reverse osmosis is a currently available treatment technology which could reduce conductivity levels below 300 microsiemens per centimeter, the threshold above which current science concludes impairment is probable. Dr. McAvoy explained how reverse osmosis is in current use in wastewater treatment and relied, in part, on its proposed use in the Boardtree watershed adjacent to Stillhouse. Reverse osmosis has been used in other industries, such as manufacturing, to produce pure water, devoid of any ions such as those which make up conductivity. However, that application of the technology is generally dissimilar to employing it in a surface mine setting. Using a reverse osmosis treatment system here entails substantial pre- and post-treatment components, for example a large equalization capacity. The flow of water entering Stillhouse Branch on and through the valley fill, where it picks up the ions producing high conductivity, varies greatly depending on precipitation events. The average flow is estimated to be about 800 gallons per minute, but actual measurements have been as low as 66 gallons per minute, and are

anticipated to be in the thousands of gallons after rainfall. The flow into the treatment system must be modulated within much narrower parameters, so heavier flows must be diverted, retained, and released steadily within a design flow range, referred to as "equalization." Equalization would require a significantly large basin or set of tanks somewhere close to the Stillhouse Branch outlet, to hold a large volume of water. Similarly, pre-treatment, consisting of "softening" the effluent by coagulation, floccation, sedimentation, and filtration to remove particulates, would require a large facility before the water even reaches the reverse osmosis system itself. All of this requires a significant amount of power to run pumps capable of operating the system. About 15% of the water, heavily concentrated with the removed salts, would then be dealt with as waste, to be evaporated or otherwise reduced so that remaining solids could be placed in a landfill.

Though Dr. McAvoy did not claim to have designed a reverse osmosis treatment plan here (instead merely identifying it as an available technology capable of reducing conductivity), his testimony revealed many reasons to doubt the feasibility of reverse osmosis treatment at Stillhouse Branch. Foremost, reverse osmosis treatment has been used primarily in other industries which do not pose the same challenges present here. The large footprint of reverse osmosis treatment, including an equalization system, are problematic in the valley setting where Stillhouse Branch flows. This treatment would require a substantial power source, and produce a sizable amount of wastewater or solid waste. Second, there is a lack of experience with this treatment in a surface mine setting, where weather conditions vary tremendously and other variables are unlike the settings in which it is presently used. For instance, the pure water coming out of the reverse osmosis system would likely have to be blended with other water to make it suitable for aquatic life. The two sources of support cited by Dr. McAvoy for use of reverse osmosis here – the 2013

Veolia report and the recommendation of Tom Sandy with CH2MHill in 2014– were proposals, not operating facilities with proven success. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 1, at 2, 3, ECF No. 147.

Mr. Meek, Defendant's environmental engineer expert witness, provided a critique of the reverse osmosis treatment option and offered, as an alternative, a series of water management plans to reduce conductivity in Stillhouse Branch and eventually achieve passing WVSCI scores. Mr. Meek has some actual experience with reverse osmosis treatment systems, and was able to estimate costs and consider design challenges. As to the latter, Meek pointed out the large footprint of the reverse osmosis treatment system, which would likely require it to be placed on the valley fill. A large equalization basin, the treatment structures, a system of pumps, and other facilities would have to be constructed, either on the fill or along the riparian area, presenting significant issues unaddressed by Dr. McAvoy. Furthermore, Mr. Meek estimated a capital expenditure of $48 million with annual operating costs of $4 million, amounting to over $136 million in discounted costs over thirty-five years. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 2, at 19, ECF No. 147. On its face, this cost projection places reverse osmosis treatment, currently, outside the realm of reasonable.

As with Dr. McAvoy, Mr. Meek's search for other treatment systems was unavailing. Biologic agents have not been demonstrated to be feasible treatment in this setting; chemical treatments using mineral precipitation have not been used on this scale. Neither side could identify any currently available treatment options besides reverse osmosis. The reverse osmosis system's cost and complications make it too expensive and too uncertain at this point.

The lack of viable, affordable treatment option leaves water management alternatives as the only practical, albeit limited, solution to Defendant's violations. As presented by Mr. Meek, water management could be used in a phased approach to address Defendant's water quality violations in Stillhouse Branch. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 2, at 9, ECF No. 147. Defendant's proposal entails several alternative steps which could be employed in sequence until the goal is met. *Id.* The first step, Alternative 1, would separate the surface flow from the seepage flow at the toe of the valley fill, and divert the higher conductivity-laden underground flow directly to Twentymile Creek, bypassing Stillhouse Branch. *Id.* This step assumes that the surface water is less polluted in terms of conductivity and thus may support aquatic life consistent with a passing WVSCI score. Presumably, the diverted underground flow, though higher in conductivity than when combined with surface runoff, would not affect Twentymile Creek since it is currently discharged there anyway. There are questions, though, about whether only surface flow provides enough water volume to keep Stillhouse Branch from drying up or to sustain periods of high flow to flush out debris and sediment, characteristics expected of headwater streams such as this.

Defendant proposed a sequence of alternatives in addition to Alternative 1 if necessary to achieve compliance. Alternative 2 would reduce infiltration through the valley fill, by using surface water control structures. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 2, at 11, ECF No. 147. This Alternative could also include impermeable lining to further reduce water draining through the valley. *Id.* at 13. Alternatives 3, 4, and 5 involve piping water from other sources to Stillhouse, or from it to a larger stream. *Id.* at 14–17. If surface flow is insufficient to sustain Stillhouse Branch, or if adding water to dilute the conductivity of Stillhouse Branch's surface

runoff is necessary, there seems to be only two sources of water – Twentymile Creek or the Gauley River. Either source presents serious issues that merit further examination before being undertaken. At this point, these alternatives would be more artificial and environmentally intrusive than the other options.

III. Specific Relief

Having reviewed Defendant's expert report and considered all of the testimony and evidence at trial, the Court concludes that Alternatives 1 and 2 should be further examined and implemented through the expertise of the Special Master. Alternative 1, segregating and transporting seepage flow from an underdrain directly to Twentymile Creek, is relatively simple and inexpensive. The Court **DIRECTS** Defendant, through the guidance and approval of the Special Master, to install the Alternative 1 system with due diligence. Before approving Defendant's plan to do so, the Special Master will evaluate whether Defendant's plan is reasonably likely to maintain the flow level of Stillhouse Branch necessary to achieve water quality standards. Further, the Court **DIRECTS** Defendant to more fully evaluate, under conditions set by the Special Master, the viability, efficacy, and cost of implementing Alternative 2, in concert with implementation of Alternative 1. Reducing the infiltration of precipitation through the valley fill and increasing the surface flow into Stillhouse Branch would serve two important purposes – maintaining sufficient flow with less conductivity into the stream and reducing the seepage containing high conductivity to be transported to Twentymile Creek. The Special Master may consider and require further evaluation and use of the Alternative 2 approach if he finds it reasonably likely and appropriate to achieve compliance.

To effectuate his review and supervision, the Special Master is authorized to:

1. Develop and require engineering plans and environmental assessments including, but not limited to, sampling, flow measurements, modeling, toxicity identification evaluations, and other matters deemed appropriate by the Special Master to evaluate, approve, and implement measures required in this Order.
2. Develop and require as deemed appropriate by the Special Master measures to monitor and evaluate the effects of Defendant's implementation of its water management strategies directed by the Order.
3. Require Defendant to further develop a pilot program to evaluate the availability and efficiency of using chemical mineral precipitation treatment as summarized in alternatives 4.1 and 4.2 of Mr. Meek's report, or similar technologies. *Pls' Resp. in Opp'n to Def's Mot. in Lim.* Ex. 2, at 5–6, ECF No. 147.

Additionally, where any compliance obligation under this Order requires Defendants to obtain a federal, state, or local permit or approval, Defendant shall submit timely and substantially complete applications and take all other actions necessary to obtain such permits or approvals.

The Court also notes that the parties have entered into a Consent Decree in the case of *Sierra Club v. Fola*, Civil Action No. 2:10-1199 on February 9, 2012. This matter involves substantially similar circumstances arising from Defendant's violations in Boardtree Branch, which is adjacent to Stillhouse Branch. As the Court understands that matter, Fola was required to undertake habitat restoration first, and then, if necessary to achieve compliance, either treatment or abatement. The Court further understands that post-restoration stream conditions have been monitored and the data reported, but the Special Master of Biology has recently concluded that habitat restoration has not resulted in success and is unlikely to lead to success in the short term.

As such, Defendant has recently advised of its intention to implement some form of water management as an abatement alternative to treatment to achieve compliance with the Consent Decree in that case. Mr. Kyles serves as Special Master of Engineering in the Boardtree case. The Court authorizes the Special Master to consider whether measures approved for compliance in Boardtree Branch should be used for compliance in Stillhouse Branch or undertaken in some joint or coordinated fashion.

The Court **DIRECTS** the Clerk to send a copy of this Order to counsel of record, the Special Master, and any unrepresented parties.

ENTER: December 8, 2015

ROBERT C. CHAMBERS, CHIEF JUDGE